

20

WHAT IS CLAIMED IS:

1. An improved tong positioning device, comprising:

a. a base portion;

b. a first arm portion pivotally attached to the base portion;

25 c. a power means engaged to a first end of the arm portion;

d. an extension arm portion attached to the second end of the first arm portion;

30 e. a second arm portion pivotally attached to a second end or an extension arm portion of the arm portion; and

35 f. a second end of the second arm portion secured to a tong, so that pivotal movement of the arm portions imparted by the power means imparts movement of the tong between engaged and disengaged positions around tubular members.

2. The device in claim 1, wherein the power means comprises a hydraulic cylinder.

40 3. The device in claim 1, wherein the power means comprises an air cylinder.

4. The device in claim 1, wherein the first arm is attached to an end of a piston in the hydraulic cylinder.

45 5. The device in claim 1, wherein the first arm is driven by the power means to impart pivoting motion to the second arm portion and forward and backward motion to the tong.

50 6. The device in claim 1, wherein the second arm further comprises a pair of air cylinders which define a means for allowing the arm to impart smooth, non-jerky contact with and movement to the tong.

55 7. The device in claim 1 wherein the pivot points between the power means, first arm member and second arm portion are variable to compensate for the vertical and horizontal movement of the tong during operation.

8. The device in claim 1, further comprising a protective shield positionable over the device so that minimum contact with the moving parts of the device by an operator is achieved.

60 9. The device in claim 1, wherein the first articulating arm defines a moment arm moveable between vertical and horizontal positions on the base.

65 10. The device in claim 1, wherein the second articulating arm defines a forward shock absorbing arm member providing ease of movement of the tong.

11. An improved tong positioning apparatus, comprising:

- a. a power means;
  - b. an articulating means secured at a first end to the power means; and
  - c. a second end of the articulating means attached to a tong to impart movement of the tong between engaged and disengaged positions around a tubular member when the power means articulates the articulating means.
- 70

- 75        12.     The apparatus in claim 11, wherein the power means comprises a hydraulic cylinder, air cylinder or other power device.
13.     The apparatus in claim 11, wherein the articulating means comprises a first moment arm
- 80        pivotally secured to a second forward shock absorbing arm.
14.     The apparatus in claim 13, wherein the forward shock absorbing arm further comprises at least one air or gas shock/cylinder for absorbing shock between the
- 85        arm and the tong, so as to impart smooth movement of the tong as it contacts lengths of tubular members.
15.     An improved tong positioning apparatus, comprising:
- 90        a. a base, including a powered cylinder;
- b. a first arm attached to the cylinder and pivotally attached to the base;
- c. a second arm attached to a second end of the first articulating arm;
- 95        d. a tong attached to the second arm, so that when the cylinder moves from retracted and expanded positions, the first and second arms articulate to move the tong between engaged and disengaged positions relative to conjoined tubular members.
- 100      16.     The apparatus in claim 15, further comprising a protective shield to protect the operator of the apparatus from moving parts of the apparatus.

105 17. The apparatus in claim 15, wherein the connections between the powered cylinder and the first arm provide a plurality of connection points.

18. The apparatus in claim 15, wherein the pivot points between the first arm and the base define a plurality of connection points.

110 19. The apparatus in claim 15, wherein the connection between the first arm and the second arm define a plurality of connection points.

115 20. The apparatus in claim 15, wherein the connection points between the cylinder and the base, and the first arm and the base and the first arm and the second arm define a means to allow a variation of the horizontal and vertical position of the device relative to the tong.

21. An improved tong positioning apparatus, comprising:

- 120 a. a base, including a powered cylinder;
- b. a first arm attached to the cylinder and pivotally attached to the base;
- c. a second arm attached to a second end of the first articulating arm;
- 125 d. a tong attached to the second arm, so that when the cylinder moves from retracted and expanded positions, the first and second arms articulate to move the tong between engaged and disengaged positions relative to conjoined tubular members.

130 22. An improved method to position and align the power  
tong to engage and disengage positions relative to  
conjoined tubular members:

a. A tong guide system which guides the power  
tongs onto each pipe section

135 b. A tong guide system articulating the  
alignment of the upper tong and lower tong in relation  
to each jaw - die combination and each pipe section  
utilizing positioning and alignment pads;

140 c. A means for visual acuity utilizing miniature  
intrinsically safe video cameras mounted in such  
position and location and close proximity to the power  
tong located at the pipe sections being connected to  
one another, in order to observe the makeup procedure  
by utilizing monitors and further may also review  
digital or VHS taping before and during makeup of the  
145 threaded pipe connections.